EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	16	(optically with isolated) with (oxide or nitride)	US-PGPUB; USPAT	OR	ON	2006/07/21 13:32
L2	45	(optically with isolated) same (oxide or nitride)	US-PGPUB; USPAT	OR	ON	2006/07/21 13:10
L3	29	2 not 1	US-PGPUB; USPAT	OR	ON	2006/07/21 13:32
L4	3593	(opaque) with (oxide or nitride)	US-PGPUB; USPAT	OR	ON	2006/07/21 13:14
L5	2075	4 and optical	US-PGPUB; USPAT	OR	ON	2006/07/21 13:14
L6	350	4 same optical	US-PGPUB; USPAT	OR	ON	2006/07/21 13:14
L7	81	(optically with opaque) with (oxide or nitride)	US-PGPUB; USPAT	OR	ON	2006/07/21 13:38
L8	81	7 not 1	US-PGPUB; USPAT	OR	ON	2006/07/21 13:32
L9	61	8 not 6	US-PGPUB; USPAT	OR	ON	2006/07/21 13:32
L10	397	(optically with (opaque or isolated or adequate)) and (GaN or (gallium adj nitride) or SiC or (silicon adj carbide))	US-PGPUB; USPAT	OR	ON	2006/07/21 13:53
L11	45	((trench or via or hole or opening or aperture or groove) with optically with (opaque or isolated or adequate)) and (GaN or (gallium adj nitride) or SiC or (silicon adj carbide))	US-PGPUB; USPAT	OR	ON	2006/07/21 13:53
L12	34	11 and @ad<"20031104"	US-PGPUB; USPAT	OR	ON	2006/07/21 13:54
L13	7856	((trench or via or hole or opening or aperture or groove) with (polysilicon or titanium or aluminum or tungsten)) and (GaN or (gallium adj nitride) or SiC or (silicon adj carbide))	US-PGPUB; USPAT	OR	ON	2006/07/21 13:54
L14	889	((trench or via or hole or opening or aperture or groove) with (polysilicon or titanium or aluminum or tungsten)) same (GaN or (gallium adj nitride) or SiC or (silicon adj carbide))	US-PGPUB; USPAT	OR	ON	2006/07/21 13:54
L15	736	14 and @ad<"20031104"	US-PGPUB; USPAT	OR	ON	2006/07/21 13:54

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	131	etching with (RIE or ICP) with (SiC or (silcion adj carbide))	US-PGPUB; USPAT	OR	ON	2006/07/21 16:02
L2	102	1 and ((substrate or wafer) with (SiC or (silcion adj carbide)))	US-PGPUB; USPAT	OR	ON	2006/07/21 16:02
L3	79	2 and @ad<"20031106"	US-PGPUB; USPAT	OR	ON	2006/07/21 16:03

DOCUMENT-IDENTIFIER: US 20020066960 A1

TITLE: Method of forming vias in silicon carbide and resulting devices and circuits

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Summary of Invention Paragraph - BSTX (20):

[0019] The use of **ICP** (inductively coupled plasma) and ECR (electron cyclotron resonance) sources for **SiC etching** have resulted in higher etch rates as compared to **RIE** (reactive ion etch). Both ICP and ECR systems use lower operating pressure (e.g., 1 to 20 milliTorr), higher plasma density (10.sup.11 to 10.sup.12 cm.sup.-3) and lower ion energies compared to RIE systems. The combination of these parameters result in high etch rate of SiC and minimal erosion of the etch mask. RIE systems use higher pressure (10 to 300 milliTorr) lower plasma density (10.sup.10 cm.sup.-3) and higher ion energies to break SiC bonds and etch; however, the detrimental effects of high ion energies and low plasma density include mask erosion and lower etch rate.

Summary of Invention Paragraph - BSTX (22):

[0021] Previous attempts at using plasma chemistries for high-density plasma etching of SiC include the use of chlorine (Cl.sub.2), bromine (Br.sub.2), or iodine (I.sup.2)-based gases. However, the use of fluorine-based gas has produced much higher etch rates. For example, Hong et al., Plasma Chemistries for High Density Plasma **Etching of SiC,** J. Electronic Materials, Vol. 28, No. 3, 196 (1999), discusses dry **etching** of 6H**--SiC** using a variety of plasma chemistries which include sulfur hexafluoride (SF.sub.6), chlorine (Cl.sub.2), iodine chloride (ICl), and iodine bromide (IBr) in high ion density plasma tools (i.e., ECR and **ICP**). These efforts have achieved etch rates of around 0.45 .mu.m/minute (4500 .ANG./minute) with SF.sub.6 plasmas. Alternatively, Cl.sub.2, ICl.sub.2, and IBr-based chemistries in ECR and ICP sources resulted in lower rates of 0.08 .mu.m/minute (800 .ANG./minute). It was found that fluorine-based plasma chemistries produced the most rapid, and hence most desirable, etch rates for SiC under high-density plasma conditions. Unfortunately, the fluorine-based chemistries displayed a poor selectivity for SiC with respect to photoresist masks.

Detail Description Paragraph - DETX (4):

[0038] FIG. 1 is a cross sectional view of a silicon carbide substrate 20 that includes a device portion indicated by the brackets 21. As stated above,

the purpose of the present invention is to form a via in the **SiC substrate** 20, and to use the via to provide an electrical path through the **substrate** 20 and to the device 21 For descriptive purposes, FIGS. 1 through 11 illustrate a single via to one contact of a single device. It will nevertheless be understood that the method of the invention, and the resulting structure, are more typically applied to forming numerous vias to numerous devices that form a circuit. Certain of the method steps of the invention are, however, most clearly set forth by simplifying the illustrations.

Detail Description Paragraph - DETX (37):

[0071] In preferred embodiments, the present invention also comprises a method of dry **etching** a via in **SiC** using sulfur hexafluoride chemistry in an inductively coupled plasma (**ICP**). In a particular embodiment of the invention, the dry etching was conducted in a Model 790 ICP system manufactured by Plasma-Therm Incorporated.

Detail Description Paragraph - DETX (39):

[0073] Prior to etching the via, the **SiC substrate** is coated with ITO, then patterned with photoresist using standard photolithography. The ITO is then dry etched in chlorine chemistry in which the photoresist is the etch mask. Vias are subsequently etched in SiC in fluorine chemistry in which the ITO is the etch mask. The via dry etch process is highly anisotropic, with SiC etch rate of 0.5 to 0.8 micron/min, and selectivity to the etch mask of 100 to 150.

US-PAT-NO: 6063693

DOCUMENT-IDENTIFIER: US 6063693 A

TITLE: Planar trenches

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Detailed Description Text - DETX (10):

In an embodiment of the method according to the present invention for forming planar trenches, as illustrated in FIGS. 2a-2d, a trench is etched in the substrate in a conventional manner, for example, as described above with respect to FIGS. 1a-1d. For the sake of example the invention is illustrated by embodiments using a silicon substrate, silicon oxides as insulating material and polysilicon as a filling material. It is also conceivable to use other semiconductors e.g. **silicon carbide** or other group 3 or group 5 materials, or other suitable materials for the substrate and the insulating materials can be any suitable compounds such as oxides, nitrides or the like, and combinations thereof. Furthermore the **trench** filling material is not limited to **polysilicon** but could be, for example, amorphous silicon, micro-crystalline silicon or crystalline silicon compounds. In the event that the trench structure is formed in a substrate based on a material other than silicon is used then it is naturally possible to use other filling materials with the appropriate properties.

US-PAT-NO: 6924241

DOCUMENT-IDENTIFIER: US 6924241 B2

TITLE: Method of making a silicon nitride film that is transmissive to ultraviolet light

---------- KWIC ---------

Detailed Description Text - DETX (25):

To detect the pinhole defects displayed in FIG. 4, the samples were etched in an aluminum wet etch solution, which consisted of 16H.sub.3 PO.sub.4 :1 HNO.sub.3 :1 H.sub.3 NO:2 H.sub.2 O, maintained at a temperature of 40 degrees Centigrade, for 10 minutes, and then inspected under an optical microscope. The UV silicon nitride had a total of only about seven pinhole defects in a given inspection area. In contrast, the other passivation films, such as the conventional **opaque** PECVD silicon **nitride** and the UV oxynitride had about 15 pinhole defects, and the conventional silicon oxynitride had 22 pinhole defects in the same inspection area. Therefore, it can be concluded that the UV silicon nitride produced according to the process recipe disclosed herein is very good as a barrier film against the aluminum etchant.

US-PAT-NO: 6495202

DOCUMENT-IDENTIFIER: US 6495202 B1

TITLE: Method for manufacturing an optical element containing fluoride in at least its surface portions

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Brief Summary Text - BSTX (6):

Fluoride materials are transparent over a broad light wavelength range extending from the infrared region to the ultraviolet region. Especially at wavelengths shorter than 180 nm, most fluorides are transparent, while almost all **oxide** materials are **opaque**. As a result, fluorides are indispensable materials for optical elements used in the ultraviolet region.

US-PAT-NO: 5935638

DOCUMENT-IDENTIFIER: US 5935638 A

TITLE: Silicon dioxide containing coating

---------- KWIC ---------

Brief Summary Text - BSTX (26):

Optically opaque fillers are fillers that render the silicon dioxide containing coating impenetrable to visual light. **Optically opaque** fillers include **oxides, nitrides,** and carbides of silicon, alumina, metals, and inorganic pigments. Preferred **optically opaque** fillers include plasma alumina microballoons having an average particle size of about 6 micrometers, silica microballoons having an average particle size of about 5 to 40 micrometers, silicon **nitride** (Si.sub.3 N.sub.4) powder or whiskers, silicon carbide powder or whiskers, aluminum **nitride** powder, and black inorganic pigments such as black FERRO.RTM. F6331 having an average particle size of about 0.4 micrometers.